

Grants Reclamation Project Chinle Background Standards Summary

- Major ion chemistry (i.e. water type) and recharge source were the primary reasons for a common mixing zone between the three Chinle aquifers
 - The mixing zone is in direct hydraulic contact with the alluvial system (i.e. it effectively functions as a single system in spite of the change in geologic setting)
 - Recharge to the Chinle aquifers comes entirely from the alluvial aquifer (i.e. there is no blending of resident water and alluvial recharge, unlike aquifers like the San Andres-Glorieta)
 - Water type resembles alluvial water for a certain distance downdip from the subcrop (calcium and sulfate dominated)
- Major ion chemistry was the primary driver delineating the mixing and non-mixing zones
 - In the Upper and Middle Chinle aquifers, a calcium concentration of 30 mg/L was used as the primary delineator between mixing and non-mixing zones
 - Sodium becomes major cation in non-mixing zones
 - Sulfate remains dominant anion
 - The degradation of the water quality as the water moves downdip prevented this approach in the Lower Chinle
 - The delineation was set at essentially a fixed distance from the subcrop based upon well CW41
 - Wells not included within the background data set were used to delineate mixing zones
 - Although some of those wells used to delineate the mixing zones were impacted by tailings seepage, the major ion chemistry was unchanged
 - Some wells don't fit the conceptual model in respects to the calcium and sodium values but were included in their respective dataset due to where they sit spatially
- Middle Chinle west of the West Fault historically discharges to the alluvial system in the subcrop west of the LTP
 - Gradient reversal occurred in mid-2000s due to injection into the WR wells west of the subcrop and continued collection in the S wells to the east of the subcrop
 - Wells were included in the mixing zone dataset due to the major ion chemistry